

REMARKS

In a non-final Office Action mailed October 17, 2006, the Examiner rejected the claims for a variety of reasons. Applicants respond to each of the Examiner's rejections below. In view of the amendments noted above and the arguments presented herein, Applicants respectfully request reconsideration of the merits of this application.

Rejections Under 35 U.S.C. § 102(b)

Jones

Claims 1-4 and 10-12 are rejected under 35 U.S.C. § 102(b) as being anticipated by Jones J, "Interaction of coagulase negative staphylococci with lectins," *J. Clin. Pathol.* 46:761-763 (1993). The Examiner alleges that Jones anticipates the pending claims by teaching a method of producing a bacterial aggregate from coagulase negative staphylococci and various plant lectins, including Concanavalin A (ConA).

Applicants amend Claim 1 to recite the limitations of Claim 6. That is, the bacterial aggregate is coated with a second mixture of bacteria and lectin, such that a lamellar aggregate is constructed. Consequently, Applicants cancel Claims 6-7 and 9. In addition, Applicants amend Claim 10 to recite that the microbial aggregate is formed by combining at least two distinct species of microbes. Support for this amendment is located at paragraph [0007] of the above-identified application. In contrast to the amended claims, Jones only discloses an aggregate of one species of bacteria with lectin. As such, Jones does not anticipate the pending claims. In view of these remarks, Applicants respectfully request reconsideration of this rejection as applied to Claims 1-4 and 10-12.

Liljemark *et al.*

Claims 1-4 and 10-12 are rejected under 35 U.S.C. § 102(b) as being anticipated by Liljemark W, *et al.*, "Effect of bacterial aggregation on the adherence of oral streptococci to hydroxyapatite," *Infect. Immun.* 31:935-941 (1981). The Examiner alleges that Liljemark *et al.* anticipate the pending claims by teaching a method of testing aggregation and adherence of oral streptococci to hydroxyapatite beads.

As noted above, Applicants amend Claims 1 and 10 to recite that the aggregate is coated with a second layer of bacteria or that that the aggregate comprises more than one microbe, respectively. Like Jones, Liljemark *et al.* disclose neither of these limitations. At most, Liljemark *et al.* discloses aggregating one species of bacteria with lectin. While

Applicants acknowledge that *Liljemark et al.* disclose co-aggregates of two bacteria, the co-aggregates were created independent of lectin. That is, the aggregation depended upon an inherent property of the bacteria themselves. *See* p. 936, sentence bridging the first and second columns; and p. 938, section titled, "Adherence of coaggregating bacteria." As such, *Liljemark et al.* do not anticipate the pending claims. In view of these remarks, Applicants respectfully request reconsideration of this rejection as applied to Claims 1-4 and 10-12.

Rejections Under 35 U.S.C. § 103(a)

Liljemark et al.

Claims 1-5 and 10-12 are rejected under 35 U.S.C. § 103(a) as being obvious over *Liljemark et al.* (cited above). The Examiner alleges that even though *Liljemark et al.* do not teach an aggregate of two different types of oral streptococci formed by Con A, it would have been obvious to one skilled in the art. Applicants respectfully disagree.

Liljemark et al. is directed to the effect of bacterial aggregation on adherence to spheroidal hydroxyapatite or saliva-coated hydroxyapatite, and disclose co-aggregates of two bacteria, wherein aggregation depends upon an inherent property of the bacteria. Nowhere do *Liljemark et al.* teach, motive or suggest to one skilled in the art that co-aggregation can be accomplished with lectin. If indeed it is obvious to one skilled in the art to use lectin to co-aggregate more than one type of bacteria, then Applicants ask the Examiner to query why *Liljemark et al.* failed to do so? In addition, *Liljemark et al.* do not disclose any deficiencies in their co-aggregation method that would lead one skilled in the art to co-aggregate bacteria with lectin. As such, one skilled in the art would not have been motivated to modify *Liljemark et al.*'s method.

Likewise, *Liljemark et al.* do not teach, motivate or suggest to one skilled in the art that lectin can be used to co-aggregate eukaryotic organisms such as yeast and fungi, as recited in pending Claim 11. In fact, *Liljemark et al.* is directed solely to oral bacteria, namely Streptococcal species. As such, the Examiner has impermissibly used "hindsight" to reject the pending claims. Indeed, it appears the Examiner inadvertently used Applicants' teaching as a blueprint to look through the cited documents and piece together (somewhat out of context) elements therein to defeat the patentability of the embodiments captured in the pending claims. This type of examination is unreasonable and is prohibited by MPEP § 2142. In view of these remarks, Applicants respectfully request reconsideration of this rejection as applied to Claims 1-5 and 10-12.

In the interest of advancing prosecution of the above-identified application, Applicants add new Claims 14-17. Claim 14 clarifies the structural relationship between the bacteria of the overall aggregate. Applicants note that the methods disclosed in the above-identified application allow one skilled in the art to create an aggregate that has heretofore not been described -- that is, the aggregate has a known size and a defined spatial organization. In particular, Applicants note that nowhere does the art describe creating an aggregate having a lectin-created core that is surrounded by a lectin-created shell. Support for the new claims is located in FIG. 3, in paragraphs [0012], [0024] to [0025] and [0031], as well as in Example C.

Jones in view of Hussain *et al.*

Claims 1-4, 8 and 10-13 are rejected under 35 U.S.C. § 103(a) as being obvious over Jones (cited above) in view of Hussain M, *et al.*, "Radiochemical assay to measure the biofilm produced by coagulase-negative staphylococci on solid surfaces and its use to quantitate the effects of various antibacterial compounds on the formation of the biofilm," *J. Med. Microbiol.* 37:62-69 (1992). The Examiner alleges that even though Jones does not teach measuring bacterial viability within an aggregate in the presence of a biocide, it would have been obvious to one skilled in the art after reading Hussain *et al.*

As noted above, Claims 1 and 10 are amended to recite that the aggregate is coated with a second layer of bacteria or that that the aggregate comprises more than one microbe, respectively. Neither Jones, nor Hussain *et al.*, alone or in combination, disclose the claimed aggregates or the claimed methods of testing biocides with such aggregates. In fact, Hussain *et al.* do not add anything to Jones, as they do not create aggregates with lectin. Instead, Hussain *et al.* is directed to an assay with ¹⁴C-glucose to measure biofilm (slime) produced by coagulase negative Staphylococci, and only use lectin to detect slime production. *See* p. 63, column 1, "Detection of slime production." In addition, Hussain *et al.* discuss the effect that antibiotics may have on slime production and ultimately adherence. Unlike the above-identified application, Hussain *et al.* do not teach, motivate or suggest that the geometry of the aggregate itself may affect antibiotic resistance. Likewise, and in contrast to Hussain *et al.*, the above-identified application is directed toward the effect of the geometry of an aggregate on resistance. Furthermore, Hussain *et al.* do not teach, motivate or suggest creating aggregates with a second layer of bacteria or do not discuss aggregates comprising more than one microbe. Accordingly, it could not have been obvious to one of skill in the art,

at the time the above-identified application was filed, to combine Jones with Hussain *et al.* In view of these remarks, Applicants respectfully request reconsideration of this rejection as applied to Claims 1-4, 8 and 10-13.

Jones in view of Lamont & Rosan and Wu *et al.*

Claims 1-3, 5-7 and 10-12 are rejected under 35 U.S.C. § 103(a) as being obvious over Jones (cite above) in view of Lamont R & Rosan B, "Adherence of mutans streptococci to other oral bacteria," *Infect. Immun.* 58:1738-1743 (1990) and in further view of Wu Q, *et al.*, "Subinhibitory concentrations of antibiotics affect cell surface properties of *Streptococcus sobrinus*," *J. Bacteriol.* 177:1399-1401 (1995). The Examiner alleges that even though Jones does not teach sequential aggregation of bacteria to form a lamellar aggregate, it would have been obvious to one skilled in the art after reading Lamont & Rosan and Wu *et al.*

With respect to Jones, Applicants submit that the remarks presented above apply equally to this rejection. Lamont & Rosan is directed to an interbacterial binding of oral Streptococci to a nitrocellulose membrane. While Applicants acknowledge that Lamont & Rosan discloses co-aggregates of two bacteria, these co-aggregates, like Liljemark *et al.*, were created independent of lectin. That is, the aggregation depended upon an inherent property of the bacteria themselves. Moreover, Lamont & Rosan teach away from the present invention because when they examined the effect of lactose (which interferes with lectin-induced binding) on co-aggregation, they found that it was not affected by lactose. *See* p. 1742, first column, first full paragraph.

Wu *et al.* is directed to the effect of subinhibitory concentrations of antibiotics on cell surface properties (i.e. hydrophobicity) of aggregates composed of a single species of Streptococci. Wu *et al.*, however, do not teach, motivate or suggest to one skilled in the art to use exogenous lectin to create aggregates with a second layer of bacteria or to create an aggregate with more than one microbe. Again, the Examiner has impermissibly used "indsight" to reject the claims. As such, it appears the Examiner inadvertently used Applicants' teaching as a blueprint to look through the cited documents and piece together elements therein to defeat the patentability of the claimed embodiments. Accordingly, it was not obvious to one of skill in the art, at the time the above-identified application was filed, to combine Jones with either Lamont & Rosan or Wu *et al.* In view of these remarks, Applicants respectfully request reconsideration of this rejection as applied to Claims 1-3, 5-7 and 10-12.

Jones in view of Lamont & Rosan, Wu *et al.* and Hussain *et al.*

Claims 1-3, 5-7 and 10-12 are rejected under 35 U.S.C. § 103(a) as being obvious over Jones (cited above) in view of Lamont & Rosan (cited above), Wu *et al.* (cited above) and Hussain *et al.* (cited above). The Examiner alleges that even though Jones, Lamont & Rosan and Wu *et al.* do not teach application of biocides to a lamellar aggregate, it would have been obvious to one skilled in the art after reading Hussain *et al.*

As noted above, Claims 1 and 10 are amended to recite that the aggregate is coated with a second layer of bacteria or that that the aggregate comprises more than one microbe, respectively. With respect to all cited documents, Applicants submit that the remarks presented above for each apply equally to this rejection. In summary, none of the cited documents teaches, motivates or suggests to use lectin to create co-aggregates having a shell and a core of either a homogenous microbe or various microbes or to use such aggregates for biocide testing. Again, the Examiner has impermissibly used "hindsight" to reject the claims. As such, it appears the Examiner inadvertently used Applicants' teaching as a blueprint to look through the cited art and piece together elements therein to defeat the patentability of the claimed embodiments. Accordingly, it was not obvious to one of skill in the art, at the time the above-identified application was filed, to combine Jones, Lamont & Rosan and Wu *et al.* with Hussain *et al.* In view of these remarks, Applicants respectfully request reconsideration of this rejection as applied to Claims 1-13.

Additional Remarks

Applicants amend paragraphs [0007], [0024], [0032] and [0044] to correct typographical and/or grammatical errors. In addition, Applicants amend Tables 7 and 8, as well as Claim 5, to correct typographical and/or grammatical errors.

Fees

No fee is believed due in connection with this submission. However, if a fee is due, in this or any subsequent response, please charge the fee to Deposit Account No. 17-0055.

Application No. 10/811,651
Response dated: January 12, 2007
Reply to Office Action dated: October 17, 2006

Likewise, no extension of time is believed due, but should any extension be required in this or any subsequent response, please consider this to be a petition for the appropriate extension of time and a request to charge the petition fee due to the same Deposit Account.

Respectfully submitted,

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